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Three new species of *Ceratovacuna* Zehntner, 1897 (Aphididae: Hormaphidinae) from China

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Abstract: Three new aphid species from Hainan Province, China, are described. The diagnostic morphological characteristics of these species are detailed and illustrated. A key to apterous viviparous females of *Ceratovacuna* species is provided.

Keywords: China, Hormaphidinae, *Ceratovacuna*, new species

中国海南省粉角蚜属三新种（蚜科：扁蚜亚科）

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摘要：本文记述了来自中国海南省 3 种蚜虫新种，详细描述并图示了其鉴别形态特征，同时提供了更新的粉角蚜属无翅孤雌蚜分种检索表。

关键词：中国，扁蚜亚科，粉角蚜属，新种

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Introduction

The aphid genus *Ceratovacuna* Zehntner, 1897 is mainly distributed in tropical to subtropical areas of East and Southeast Asia. It is currently the most species-rich genus within this subfamily, comprising 25 known species (Favret 2026; Favret & Aphid Taxon Community 2026). As in other Hormaphidinae, species of *Ceratovacuna* have a complex life cycle, with obligate seasonal host alternation between primary host plants, *Styrax* spp. (Styracaceae), and secondary host plants, various species of Poaceae. They typically induce a variety of galls on their primary hosts, and most described species form colonies on the undersides of leaves of their secondary hosts. To date, most species have been described only from their secondary hosts, and detailed biological information is available for only a few species (Aoki & Kurosu 2010; Aoki *et al*. 2013; Fukatsu *et al*. 1994; Kurosu & Aoki 1990ab; Stern *et al*. 1997).

Material and methods

Field sampling

During the fieldwork, photographs of live individuals were taken using a digital camera (Sony a6500 and Laowa FE 85 mm f/5.6 2× Macro Lens). All samples were preserved in 95% ethanol and kept at -20℃ for further morphological measurement and molecular experiments.

Morphological description

Aphid terminology and the morphological measurements used in this paper follow Wang & Huang (2024). Specimens were examined and measurements and images were taken by using Nikon SMZ18 stereomicroscope. The measurements and the micrographs of mounted specimens were performedusing a computer-connected Nikon set: Nikon Eclipse Ci-L upright microscope, 16 MP digital camera with 0.55× adapter and imaging software NIS-Elements D v. 4.60.00. The unit of measurement in this paper is millimeter (mm).

The following abbreviations have been used: PT, processus terminalis; 2HT, second hind tarsal segment; URS, ultimate rostral segment; MF, mesosternal furca.

Specimen deposition

All mentioned slides examined here are deposited in the Insect Systematics & Diversity Lab, Fujian Agriculture and Forestry University, Fuzhou, China.

Taxonomy

Ceratovacuna Zehntner, 1897

Ceratovacuna Zehntner, 1897: 553; Hempel, 1901: 383; Kirkaldy, 1905: 420; Takahashi, 1931: 94; Shinji, 1941: 218; Tao, 1969: 41, 58; Ghosh, Pal & Raychaudhuri, 1977: 95; Agarwala & Ghosh, 1985: 26; Noordam, 1991: 136; Qiao & Zhang, 2003: 147; Aoki & Kurosu, 2010: 2; Zhang, Huang, Jiang & Qiao, 2013; Jiang, Chen, Guo & Qiao, 2015: 35; Jiang, Chen, Xu & Qiao, 2021: 565.

Type species: *Ceratovacuna lanigera* Zehntner, 1897 (by original monotypy)

Generic diagnosis. Apterous body oval to broadly oval. Head and pronotum fused, forming prosoma. Head with 1 pair of frontal horns, stout or blunt; well developed in apterae, reduced in alatae. Antennae 4 or 5-segmented in apterae, 5-segmented in alatae; flagellum often with spinulose imbrications. PT shorter than half length of base of terminal segment. Primary rhinaria circular, protruding; secondary rhinaria in alatae subannular, on segments III–V. Apterae with compound eyes of three ommatidia. Rostrum short; URS blunt; in apterae shorter than 2HT, without secondary setae. Apterous dorsum pale; areas bearing wax plates usually sclerotized. Wax plates distinct on head and thorax. Abdominal wax plates arranged segmentally in spinal, pleural, and marginal regions, sometimes absent; tergite VII occasionally with 1 large wax-gland group. Dorsal setae sparse, fine, apically pointed or slightly

expanded. Siphunculi pore-like, on conical elevations, usually with sclerotized margins, surrounded by several setae. Legs smooth or with small spinules; first tarsal chaetotaxy 4, 3, 2, 3, 3, 2, or 3, 2, 2; dorsal apical seta of tarsal segment II expanded. Forewing media once branched; pterostigma short. Hind wing with two oblique veins. Cauda knobbed, basally constricted, with fine setae. Anal plate bilobed. Some species have been recorded to produce a soldier caste on both primary and secondary host plants. The soldiers are fixed as first- or second-instar diapausing individuals, characterized by markedly elongated and sharpened frontal horns compared with normal morphs, and distinctly enlarged fore femora.

Taxonomic notes. Species number 25 worldwide; 19 recorded from China (Qiao *et al.* 2018). Qiao *et al.* (2015) reviewed the genus and described 5 new species in China, then Qiao *et al.* (2021) described 1 new species in China.

Ceratovacuna pikachuae sp. nov. 皮卡丘粉角蚜

https://zoobank.org/BB789AD7-4B1A-4E02-92E0-BBC83092EC53

Figs. 1; 4A; 5A, B.

Specimens examined. Holotype: 1 apterous viviparous female, CHINA: Hainan Province (Wuzhishan City: 18.8411006°N, 109.6488843°E, GCJ02; Altitude 723m), 14 Dec 2025, voucher No. WYZ_20251214_1_A (on slide), on Microsteqium sp., coll. Yi-zhe Wang (FAFU). **Paratypes**: 2 apterous viviparous females, on same slide, voucher No. WYZ_20251214_1_B to D (on slide), with the same collection data as holotype.

Etymology. The specific epithet *pikachuae* is derived from Pikachu, a well-known cartoon character from Pokémon. The new species is named for its distinctive yellow-orange body coloration and the conspicuous reddish-brown areas surrounding the siphunculi, which closely resemble the characteristic cheek blush of Pikachu. This name highlights the striking external resemblance and facilitates easy recognition of the species based on its coloration pattern.

Description.

Apterous viviparous female (in life, on secondary host): Body oval, orange. Dorsal surface sparsely covered with wax powder, not forming large masses; marginal areas bearing conspicuous, block-like wax deposits. Siphunculi and adjacent areas reddish brown, clearly distinguishable in both wax-covered and wax-free individuals (Fig. 5 A, B).

Mounted specimens (Fig. 1): Body oval; head and pronotum fused (Fig. 1A, C). Head, frontal horns, antennae, rostrum, legs, apices of siphunculi, cauda, anal plate and genital plate pale brown; remaining body parts pale (Fig. 1A). Body length 1.570–1.612 mm; width 0.864–0.995 mm. Dorsum of body bearing wax gland plates, composed of large, round to elliptical wax gland facets, separated from each other (expect those on dorsal head; Fig. 1A, C, E, N). Dorsal body setae fine, long, pointed, with slightly wavy apices.

Head. Head dorsum with 1 pair of large wax gland plates between eyes, each indistinctly composed of 4–5 small facets which closely joined together; diameter of wax gland facets 0.020–0.025 mm (Fig. 1C, F). Head and pronotum setal arrangement as shown in Fig. 4A; Head with 2 cephalic setae, 0.007–0.019 mm in length, 0.42–1.12× as long as basal diameter of Ant. segment III. Setae on head dorsum 0.065–0.089 mm in length, 3.81–5.24× as long as basal diameter of Ant. segment III. Frontal horns present (Fig. 1D), long, acute, about 0.048-0.050 mm long and 0.025-0.028 mm wide at base, 2.8× as long as basal width of antennal segment III; horns bearing 4–5 short setae each, about 0.004 mm. Distance between apices of horns 0.104 mm.

Antennae 4-segmented (Fig. 1B), 0.211–0.234 mm in total, 0.13–0.15× as long as body length. Length/width of segments I–IV and PT respectively: 35/43, 36/31, 82/32, 49/23, and 29/16. Segments I–IV each with 1–2, 2, 3, 1 setae. Setae on segment III 0.027–0.049 mm, 1.59–2.89× basal diameter of the segment (about 0.017 mm). Primary rhinaria small, round, ciliated. PT with 4–5 apical setae, 0.010 mm long.

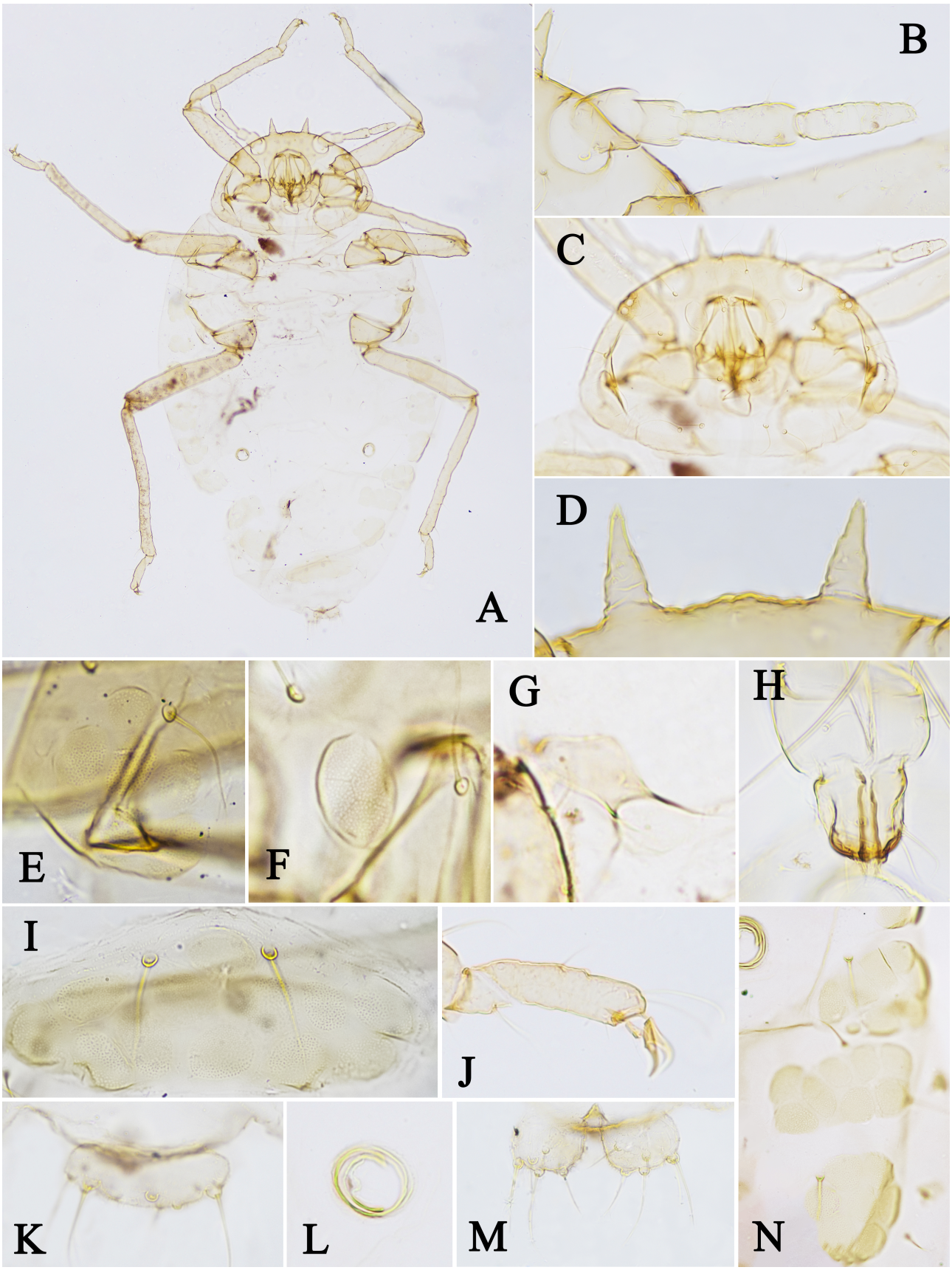

FIGURE 1. *Ceratovacuna pikachuae* **sp. nov.**, apterous viviparous female **A** dorsal view of body **B** antenna **C** head and pronotum **D** frontal horns **E** wax gland on pronotum **F** wax gland on dorsal head **G** MF **H** URS **I** spinal wax gland on abdominal tergite VIII **J** hind tarsal segment **K** cauda **L** siphunculi **M** anal plate **N** marginal wax gland on abdominal tergite III-VII (all taken fromWYZ_20251214_1_A).

Rostrum short, reaching midway between fore and middle coxae. URS wedge-shaped (Fig. 1H), 0.056–0.076 mm long and 0.091–0.109 mm wide, 0.82–0.98× as long as 2HT; bearing 3 pairs of primary setae and 1 pair of secondary setae.

Thorax. Pronotum to metanotum each with 1 pair of marginal wax gland plates composed of 5–6, 7–8, and 3–8 facets respectively (Fig. 1E); diameter of wax gland facets on thoracic dorsum 0.020–0.034 mm. Thoracic dorsal setae similar to those on head. Pronotum with 2 pairs of spinal and 2 pairs of marginal setae; mesonotum and metanotum each with 1 pair of spinal, 1–2 pair of pleural, and 2 pairs of marginal setae, 0.055–0.066 mm long. MF pale sclerotized, with 2 separated arms (Fig. 1G), each arm 0.037–0.044 mm long, 2.18–2.59× as long as basal diameter of antennal segment III.

Legs normal, bearing numerous setae. Trochanter and femur fused. Hind femur 0.360–0.381 mm long, 0.062–0.073 mm wide; hind tibia 0.431–0.475 mm long, 0.038–0.040 mm wide. 2HT 0.111 mm long (Fig. 1J).

Setae on legs sparse, fine; longest setae on hind tibia about 0.038mm. First tarsal chaetotaxy: 4(3)–2–2. First tarsal segment of fore legs with 4 setae (0.019–0.041 mm); first tarsal segment of hind legs with 2 setae (0.031–0.050 mm) (Fig. 1J).

Abdomen. Abdominal tergites I–VII each with 1 pair of marginal wax gland plates composed of 5–6, 6–7, 4–6, 5–6, 6, and 6–7 facets respectively (Fig. 1A, N). Tergite VIII with 1 spinal wax gland plate composed of 10–12 facets (Fig. 1I). Diameter of wax gland facets on abdominal tergites 0.030–0.035 mm. Abdominal tergites I–VII each with 1 pair of spinal, pleural, and marginal setae, 0.044–0.073 mm long; tergite VIII with 1 pair of spinal and 2 pair of marginal setae.

Siphunculi ring-like, situated on slightly sclerotized elevated cones, no setae bearing around (Fig. 1L), located between abdominal tergites IV and V. Apical diameter 0.037-0.040 mm, 0.36–0.45× basal width and 0.70–0.72× length of cauda.

Cauda, anal plate and genital plate covered with spinules. Cauda knobbed, Hormaphidinae type (Fig. 1K), constricted at base, 0.052–0.057 mm long and 0.083–0.104 mm wide at base; bearing 6–10 long and short setae, 0.016–0.038 mm long. Anal plate bilobed (Fig. 1M), with 5–6 long and short setae, 0.024–0.048 mm long. Genital plate with 2–3 anterior setae and 9–10 posterior setae. Gonapophyses paired, each bearing 6–7 short setae.

Taxonomic notes.

Within the genus, orange or yellow body color in life is a rare character, only *C. panici* (van der Goot, 1917), *C. lanigera* Zehntner, 1897 and *C. subtropicana* Aoki & Kurosu, 2013 have been recorded with this coloration. The new species closely resembles *C. nekoashi* (Sasaki, 1907), but differs in several respects. On the secondary host, individuals of *C. nekoashi* are described as red to brown (Aoki & Kurosu 2010, 2013), whereas *C. pikachuae* is orange and possesses a red-brown area surrounding the siphunculi, a feature absent in *C. nekoashi*. In addition, the number of facets composing the tergite wax glands (especially on tergite VIII) is fewer than that indicated in the diagnosis and illustrations provided by Takahashi (1958).

C. nekoashi was originally described from material collected on its primary host (Sasaki 1907). Takahashi (1958) was the first to record *C. nekoashi* on a secondary host, and in his description the species bears a pair of wax gland plates between the eyes. However, Qiao *et al*. (2021) presented a key to all species of *Ceratovacuna* on secondary host plants (based on apterous viviparous females), in which *C. nekoashi* is placed under “Head without wax gland plates between eyes”. For this reason, the validity of that key requires further confirmation.

***Ceratovacuna xiyui* sp. nov. 熙羽粉角蚜**

https://zoobank.org/EC1C85C2-F239-41B8-A754-8A20ED941044

Figs. 2; 4B; 5D, E.

Specimens examined. Holotype: 1 apterous viviparous female, CHINA: Hainan Province (Wuzhishan City: 18.8411006°N, 109.6488843°E, GCJ02; Altitude 723m), 14 Dec 2025, voucher No. WYZ_20251214_2_A (slide), on Dendrocalamus sp., coll. Yi-zhe Wang (FAFU). **Paratypes**: 3 apterous viviparous females, on same slide, with the same collection data as holotype.

Etymology. The species epithet *xiyui* is named in honor of Mr. Xiyu Tang, a friend of the author. The epithet is a latinized masculine genitive noun.

Description.

Apterous viviparous female (in life, on secondary host): Body oval, grey. Dorsal surface and marginal areas of the body covered with well-developed, flaky wax powder; the spaces between wax flakes distinctly reveal the body segmentation (Fig. 5D, E).

Apterous viviparous female (Mounted specimens): Body oval; head and pronotum fused (Fig. 2A). Head, frontal horns, antennae, rostrum, legs, apices of siphunculi, cauda, anal plate yellow brown; remaining body parts pale (Fig. 2A). Body length 1.570–1.612 mm; width 0.864–0.995 mm. Dorsum of body bearing wax gland plates, composed of large, round to elliptical wax gland facets, separated from each other (Fig. 2A, C). Dorsal body setae fine, long, pointed, with slightly wavy apices.

Head. Head dorsum with 1 pair of wax gland plates between eyes, each composed of 10–13 facets (Fig. 1C); diameter of wax gland facets on head dorsum 0.034–0.041 mm. Head and pronotum setal arrangement as shown in Fig. 4B; Setae on dorsal head 0.028–0.038 mm. Head with 3–4 cephalic setae, 1.27–1.67× as long as basal diameter of antennal segment III.

Frontal horns present (Fig. 2D), very short, bluntly triangular, about 0.011 mm long and 0.016 mm wide at base, 0.42–0.47× as long as basal width of antennal segment III; horns bearing 3–4 very short setae each, about 0.007 mm (Fig. 2D). Distance between apices of horns 0.113–0.121 mm.

Antennae 4-segmented (Fig. 2B), 0.16–0.22× body length. Length/width of segments I–IV and PT respectively: 37/54, 38/38, 93/35, 55/30, and 36/27. Segments I–IV each with 2 setae. Setae on segment III 0.27–0.50× basal width of the segment (0.023–0.026 mm). Primary rhinaria small, round, ciliated. PT with 3 apical setae, 0.010 mm long.

Rostrum short, reaching midway between fore and middle coxae. URS wedge-shaped (Fig. 2H), 0.129 mm long and 0.082 mm wide, 0.43–0.50× as long as 2HT; bearing 3 pairs of primary setae and 1 pair of secondary setae.

Thorax. Pronotum to metanotum each with one pair of marginal wax gland plates composed of 9, 9, and 9 facets respectively (Fig. 2A); diameter of wax gland facets on thoracic dorsum 0.038–0.045 mm. Thoracic dorsal setae similar to those on head. Pronotum with 2 pairs of spinal and 2 pairs of marginal setae; mesonotum and metanotum each with 1 pair of spinal, 1 pair of pleural, and 2 pairs of marginal setae, 0.028–0.037 mm long. MF distinctly sclerotized, with 2 separated arms (Fig. 2G), each arm 0.058 mm long, 2.23× as long as basal width of Ant. segment III.

Legs normal, bearing few setae. Trochanter and femur fused. Hind femur 0.302–0.343 mm long, 0.074–0.080 mm wide; hind tibia 0.426–0.450 mm long, 0.037–0.039 mm wide; 2HT 0.095 mm. Setae on legs sparse, fine; setae on hind tibia 0.014-0.026 mm. First tarsal chaetotaxy: 4–2–2. First tarsal segment of fore legs with 4 setae (0.016–0.028 mm long); first tarsal segment of hind legs with 2 setae (0.019–0.033 mm long) (Fig. 2F).

Abdomen. Abdominal tergites I–VI each with 1 pair of marginal wax gland plates composed of 5–6, 6–7, 4–6, 5–6, 6, and 6–7 facets respectively, and 1 pair of spinal wax gland plates composed of 5–7, 5–6, 4–5, 4–5, 5–7, and 4–7 facets respectively (Fig. 2E). Tergite VII with no spinal wax gland plates or occasionally with 0–1 facet. Tergite VIII with 1 spinal wax gland plate composed of 18 facets (Fig. 2E). Diameter of wax gland facets on abdominal tergites 0.040–0.047 mm. Abdominal tergites I–VI each with 1 pair of spinal, pleural, and marginal setae, 0.025–0.042 mm long; tergite VII with 1 pair of spinal and 1 pair of marginal setae; tergite VIII with 1 pair of spinal and 1 pair of marginal setae.

Siphunculi ring-like, situated on slightly sclerotized elevated cones, each bearing 2–3 fine pointed setae (Fig. 2J), located between abdominal tergites IV and V. Apical diameter 0.038–0.040 mm; 0.56–0.58× basal width and 0.70–0.76× length of cauda.

Cauda, anal plate and genital plate covered with spinules. Cauda knobbed, Hormaphidinae type (Fig. 1K), constricted at base, 0.053–0.057 mm long and 0.092–0.098 mm wide at base, 0.45–0.72× as long as basal width; bearing 6–7 long and short setae, 0.013–0.048 mm long. Anal plate bilobed (Fig. 2K), with 6 long and short setae, 0.029–0.063 mm long. Genital plate with 4 anterior setae and 9–10 posterior setae (Fig. 2I). Gonapophyses paired, each bearing 6–7 short setae.

Taxonomic notes.

This new species closely resembles *C. keduensis* Noordam, 1991 and *C. uscare* (Tao, 1964), but differs from them in the number of setae on cauda, the number of facets composing by wax glands, and the size of the frontal horns and wax powder arrangement in life (Fig. 5 C, D, F).

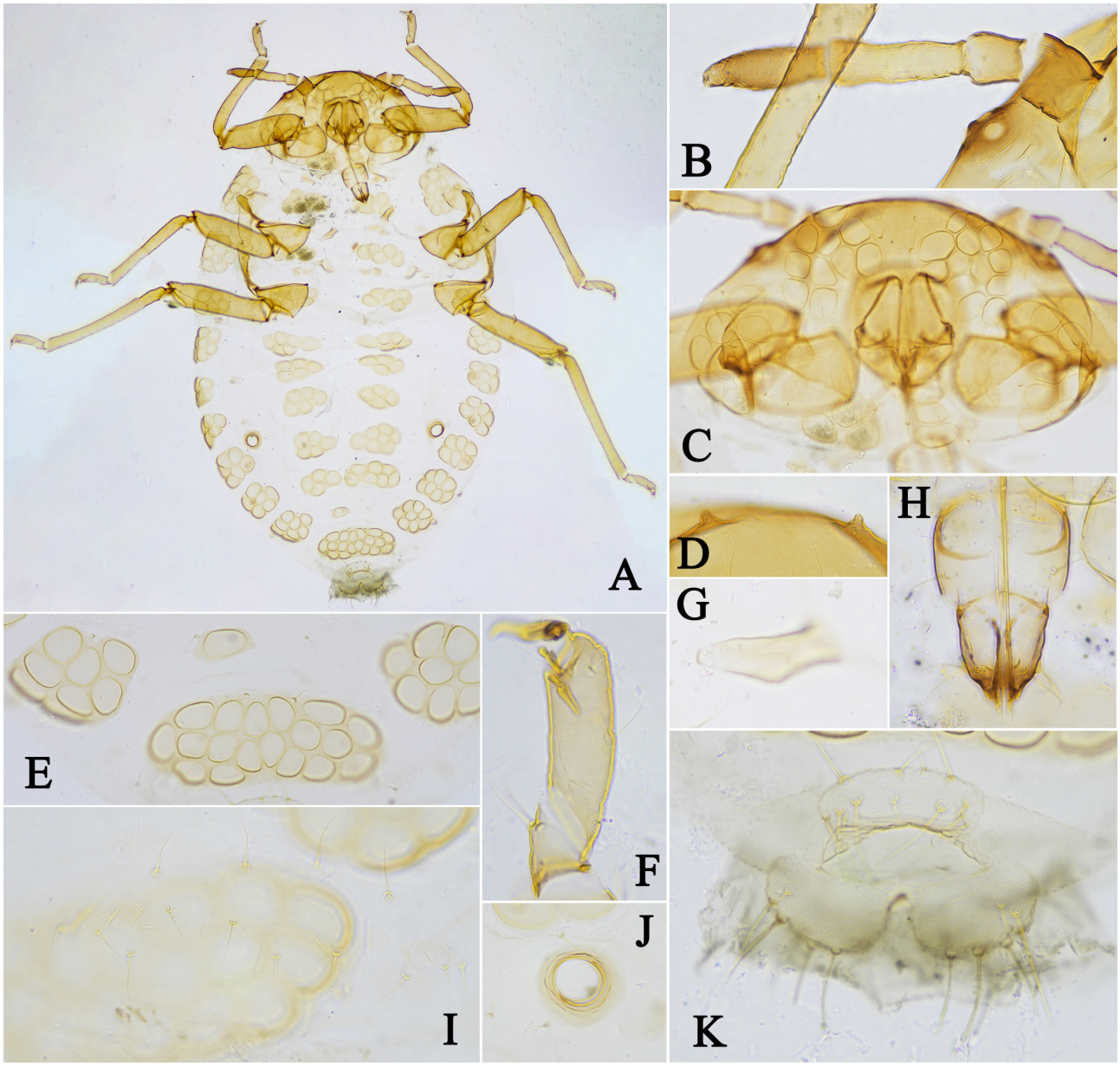

FIGURE 2. *Ceratovacuna xiyui* **sp. nov.**, apterous viviparous female **A** dorsal view of body **B** antenna **C** head and pronotum **D** frontal horns **E** wax gland on tergite VII and VIII **F** hind tarsal segment **G** MF **H** URS **I** genital plate **J** siphunculi **K** cauda and anal plate (all taken from WYZ_20251214_2_A).

Ceratovacuna hainanensis sp. nov. 海南粉角蚜

https://zoobank.org/4D9FEEDC-92D9-494A-A476-F08890B73B5C

Figs. 3; 4C; 5F.

Specimens examined. Holotype: 1 apterous viviparous female, CHINA: Hainan Province (Wuzhishan City: 19.04112561° N，109.76929753° E, GCJ02; Altitude 309m), 13 Dec 2025, voucher No. WYZ_20251213_7_A (slide), on unknown bamboo species, coll. Yi-zhe Wang (FAFU). **Paratypes**: 2 apterous viviparous females, on same slide, with the same collection data as holotype.

Etymology. The species epithet *hainanensis* refers to Hainan Island, China, where the type specimens were collected. The epithet is derived from the geographical name and formed with the Latin suffix *-ensis*, indicating place of origin.

Description.

Apterous viviparous female (in life, on secondary host): Body oval, red brown. Dorsal surface and marginal areas of the body covered with well-developed, flaky wax powder; the spaces between wax flakes distinctly reveal the body segmentation (Fig. 5F).

Apterous viviparous female (Mounted specimens): Body oval; head and pronotum fused (Fig. 3A, D). Head, frontal horns, antennae, rostrum, legs, apices of siphunculi, cauda, anal plate pale brown; remaining body parts pale (Fig. 3A). Body length 1.203–1.335 mm; width 0.616–0.729 mm. Dorsum of body bearing wax gland plates, composed of large, round to elliptical wax gland facets, separated from each other (Fig. 3A, D, F, G). Dorsal body setae fine, long, pointed, with slightly wavy apices.

Head. Head dorsum with 1 pair of wax gland plates between eyes, each composed of 6–8 facets (Fig. 3D); diameter of wax gland facets on head dorsum 0.020–0.033 mm. Head and pronotum setal arrangement as shown in Fig. 5C. Head with 6 cephalic setae, very short, about 0.010 mm, 0.7× as long as basal width of antennal segment III. Setae on head dorsum 0.040–0.054mm in length, 3.81–5.24× as long as basal width of Ant. segment III.

Frontal horns present (Fig. 4C), very short, bluntly triangular, about 0.016 mm long and 0.020 mm wide at base, 1.15× as long as basal width of antennal segment III; horns bearing 2–3 very short setae each, 0.004 mm. Distance between apices of horns 0.084–0.088 mm.

Antennae 4-segmented (Fig. 3B), 0.200–0.218 mm in total length, about 0.17× body length. Length/width of segments I–IV and PT respectively: 39/37, 35/25, 80/26, 48/22, and 21/19. Segments I–IV each with 2 setae. Setae on segment III 0.016–0.021 mm, 1.14–1.5× basal width of the segment (0.014 mm). Primary rhinaria small, round, ciliated. PT with 4 apical setae, 0.011 mm long.

Rostrum short, reaching midway between fore and middle coxae. URS wedge-shaped (Fig. 3E), 0.102 mm long and 0.070 mm wide, 1.17× as long as 2HT; bearing 3 pairs of primary setae and 1 pair of secondary setae.

Thorax. Pronotum to metanotum each with 1 pair of marginal wax gland plates composed of 6–8, 7–8, and 6–7 facets respectively. Pronotum with 1 pair of spinal wax gland plates composed of only 1 facets, mesonotum and metanotum each with 2 pairs respectively (Fig. 3A, D); diameter of wax gland facets on thoracic dorsum 0.026–0.030 mm. Thoracic dorsal setae similar to those on head. Pronotum with 2 pairs of spinal and 2 pairs of marginal setae; mesonotum and metanotum each with 1 pair of spinal, 2 pair of pleural, and 2 pairs of marginal setae, 0.016–0.045 mm long. MF distinctly sclerotized, with 2 separated arms (Fig. 3I), each arm 0.034 mm long, 2.43× as long as basal diameter of antennal segment III.

Legs normal, bearing few setae. Trochanter and femur fused. Hind femur 0.274–0.281 mm long, 0.054–0.058 mm wide; hind tibia 0.350–0.358 mm long, 0.035–0.036 mm wide; 2HT 0.087 mm long. Setae on legs sparse, fine, and moderately long; setae on hind tibia 0.011–0.026 mm. First tarsal chaetotaxy: 3–2–2. First tarsal segment of fore legs with 3 setae (0.022–0.033 mm long); first tarsal segment of hind legs with 2 setae (0.020–0.037 mm long) (Fig. 3J).

Abdomen. Abdominal tergites I–VI each with 1 pair of marginal wax gland plates composed of 3–4, 5–6, 4,

5–6, 5–6, and 6–7 facets respectively, and 1 pair of spinal wax gland plates composed of 3–4, 4–5, 4–5, 2–4, 3–4, and 2–5 facets respectively (Fig. 3A). Tergite VII with no spinal wax gland plates. Tergite VIII with 1 spinal wax gland plate composed of 11-14 facets (Fig. 3G). Diameter of wax gland facets on abdominal tergites 0.031–0.036 mm. Abdominal tergites I with 1 pair of spinal, and 1 pair pleural setae; tergites II with 1 pair of spinal and 2 pairs marginal setae; tergites III with 1 pair of spinal, 3 pairs of pleural setae; tergites IV with 1 pair of spinal, 2 pairs of

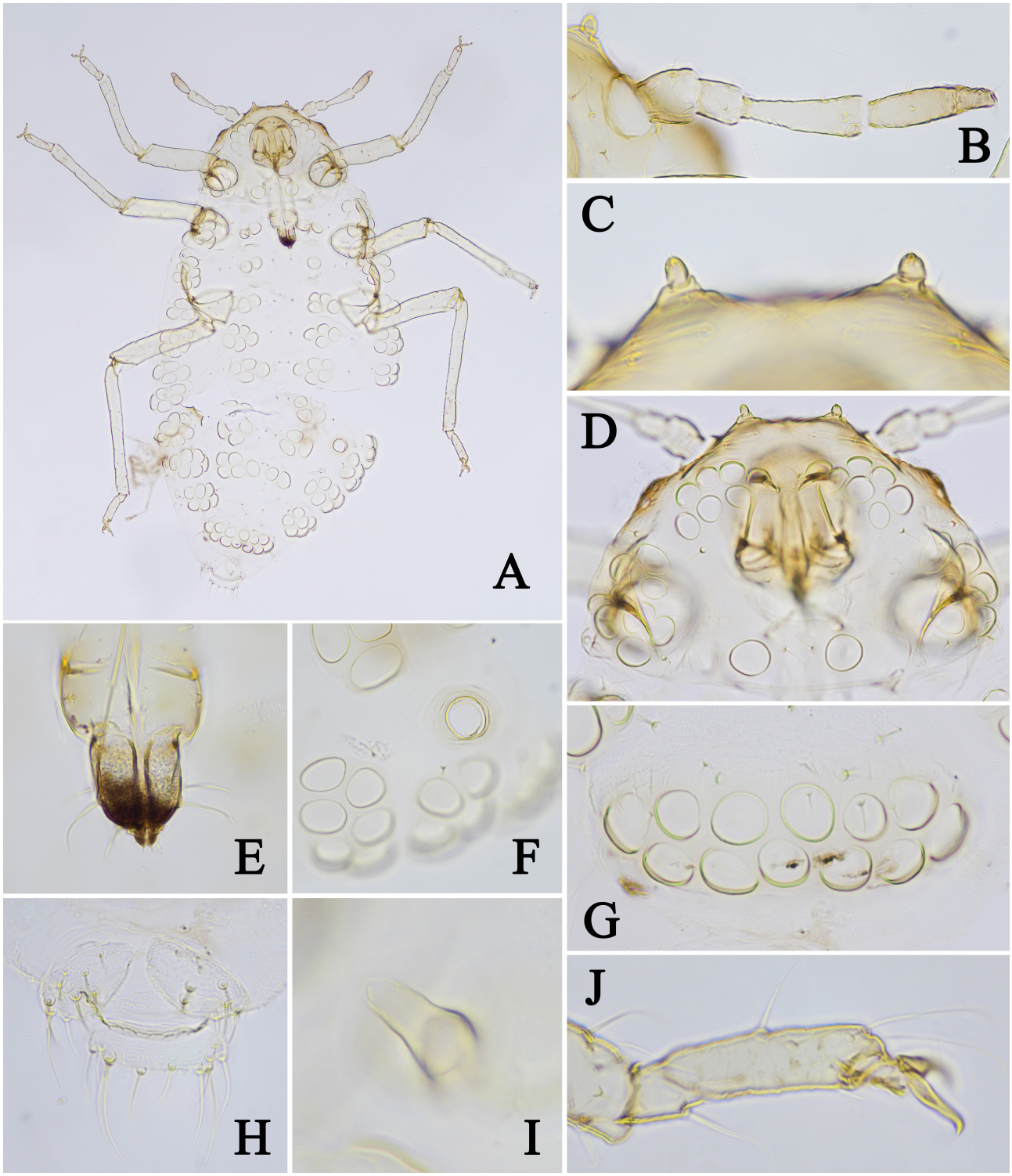

FIGURE 3. *Ceratovacuna hainanensis* **sp. nov.**, apterous viviparous female **A** dorsal view of body **B** antenna **C** frontal horns **D** head and pronotum **E** URS **F** siphunculi and marginal wax glands on tergite IV-VI **G** spinal wax gland on tergite VIII **H** cauda and anal plate **I** MF **J** hind tarsal (all taken from WYZ_20251213_7_A).

pleural setae; tergites V with 1 pair of spinal, 2 pairs of pleural and 1 pair of marginal setae; tergites VI with 1 pair

of spinal and 2 pair of marginal setae; tergite VII with 1 pair of spinal, 1 pair of plerual and 2–3 pairs of marginal setae; tergite VIII with 1 pair of spinal setae. all setae on tergites 0.031–0.049mm in length.

Siphunculi ring-like, situated on slightly sclerotized elevated cones, no setae bearing, located between abdominal tergites IV and V. Apical diameter 0.035–0.037 mm; 0.86× basal width and 0.80× length of cauda.

Cauda, anal plate and genital plate covered with spinules. Cauda knobbed, Hormaphidinae type (Fig. 3H), constricted at base, 0.044 mm long and 0.083 mm wide at base, 0.45–0.72× as long as basal width; bearing 8 long and short setae, 0.032–0.057 mm long. Anal plate bilobed (Fig. 3H), with 8 long and short setae, 0.011–0.057 mm long. Genital plate with 4 anterior setae and 6 posterior setae. Gonapophyses paired, each bearing 4–5 short setae.

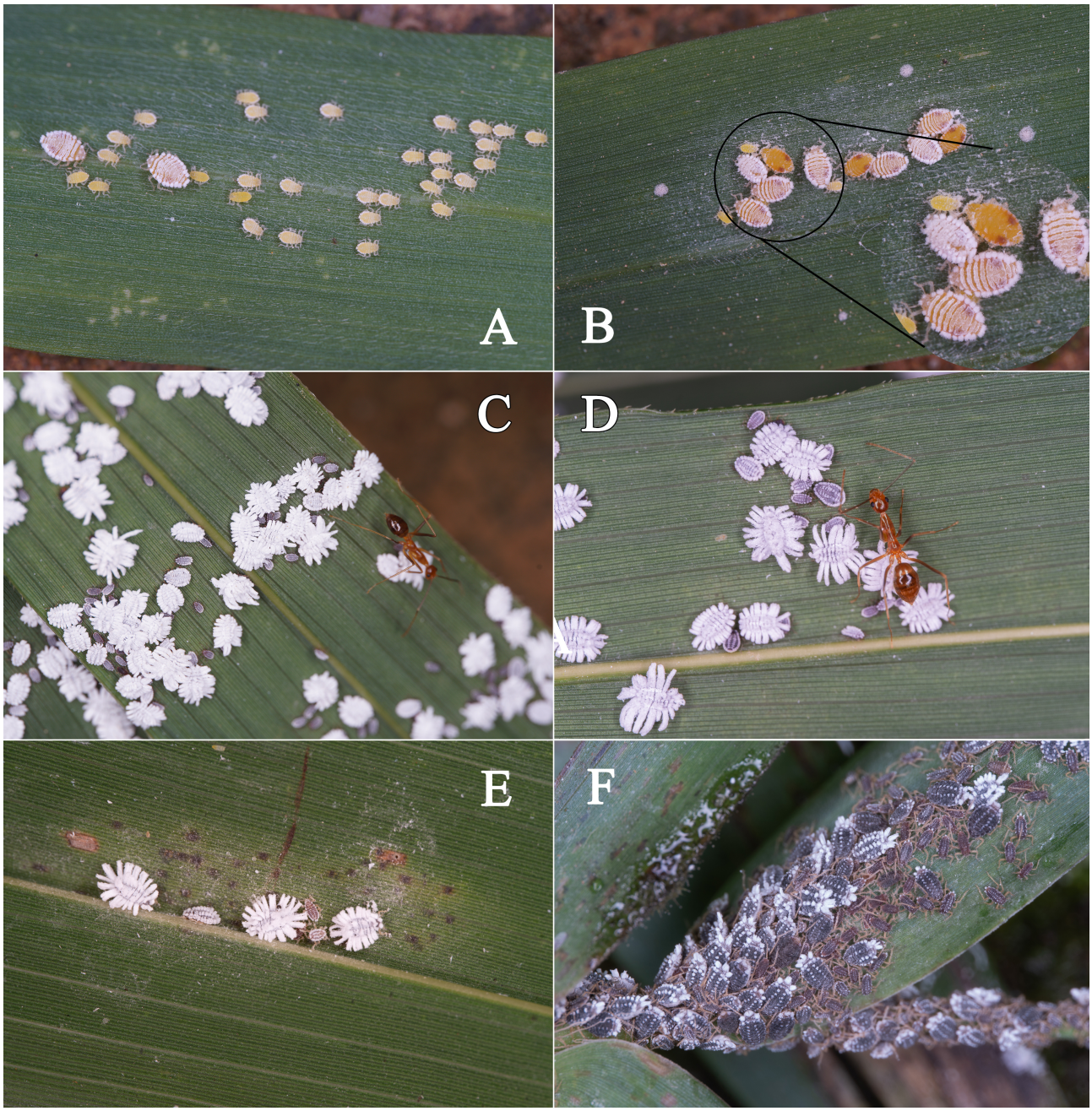

FIGURE 4. A–B *Ceratovacuna pikachuae* **sp. nov.**, colony on the underside of leaf of *Microstegium* sp. **C–D** *Ceratovacuna xiyui* **sp. nov.**, colony on the underside of leaf of *Dendrocalamus* sp., attended by an ant species, *Crematogaster* sp. **E** *Ceratovacuna hainanensis* **sp. nov.**, colony on the underside of leaf of unknown bamboo species. **F** *Ceratovacuna keduensis*, colony on the underside of leaf of unknown bamboo species (Picture **F** was taken in Sichuan, China).

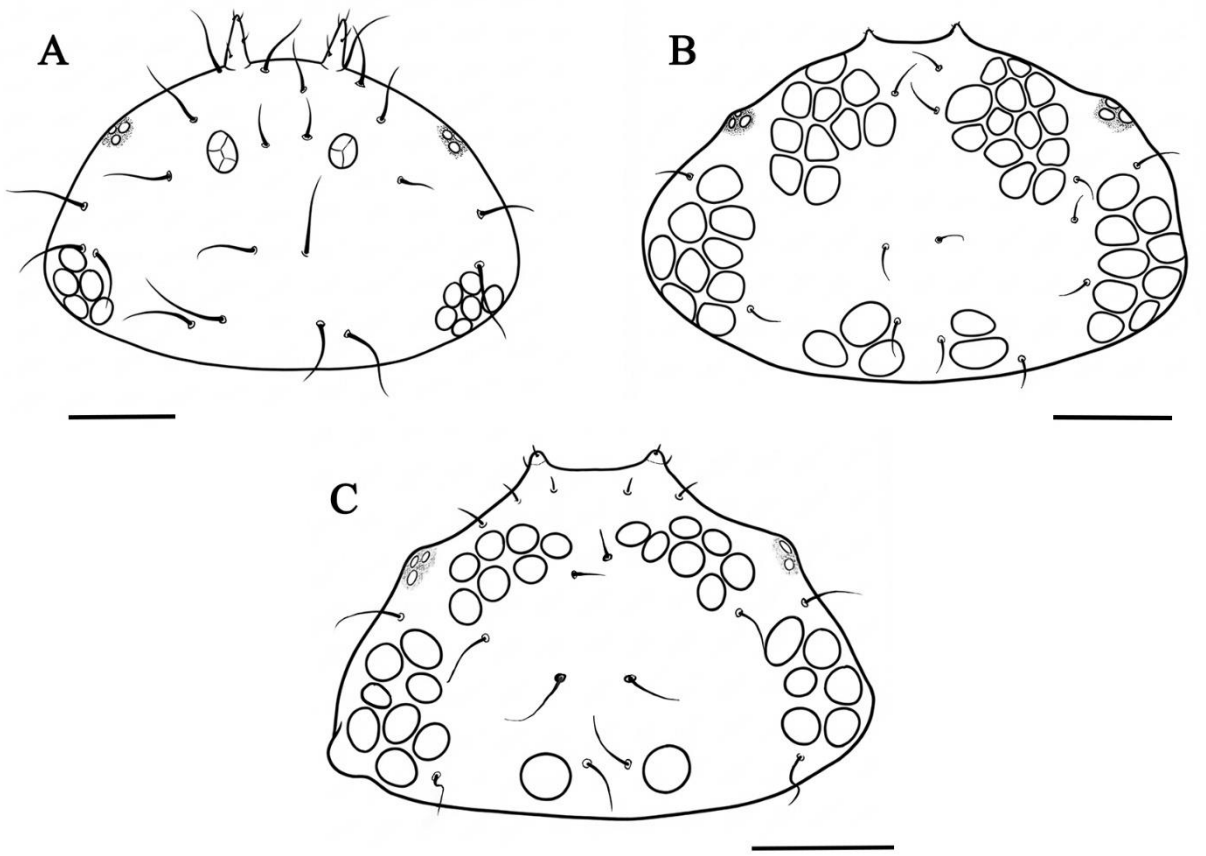

FIGURE 5. Hand-drawn illustration distribution of wax plates and the setal arrangement of the head and pronotum of the new species **A** *Ceratovacuna pikachuae* **sp. nov. B** *Ceratovacuna xiyui* **sp. nov. C** *Ceratovacuna hainanensis* **sp. nov.** Scale bars = 0.10 mm.

Discussion

The key to all species in *Ceratovacuna* on secondary host plants, based on apterous viviparous females, is provided here. The difference between this new species and the others can be found in the key. The new key is modified after Qiao *et al*. (2021).

1. Abdominal tergites I–VI with spinal wax gland plates 2
   Abdominal tergites I–VI without spinal wax gland plates 14
2. Abdominal tergites I–VI with pleural wax gland plates 3
   Abdominal tergites I–VI without pleural wax gland plates 5
3. Wax gland plates between eyes composed of 3–5 facets ..... *C. separata*
   Wax gland plates between eyes composed of 8–16 facets 4
4. Apex of frontal horn blunt. Diameter of wax gland facet on dorsum of head similar to that on abdominal tergites ..... *C. silvestrii*
   Apex of frontal horn pointed. Diameter of wax gland facet on dorsum of head shorter than 0.50 times of that on abdominal tergites ..... *C. angusticorna*
5. Abdominal tergites V–VI each with one fused spinal wax gland plate 6
   Abdominal tergites V–VI each with 2 separated spinal wax gland plates 7
6. Abdominal tergite III with one fused spinal wax gland plate ..... *C. hoffmanni*

Abdominal tergite III with 2 separated spinal wax gland plates ..... *C. imperata*

7. Head without wax gland plates between eyes 8
   Head with wax gland plates between eyes 10
8. Pronotum with wax gland plates 9
   Pronotum finely granulose, with wax pores, but without wax gland plates ..... *C. cynodonti*
9. Siphunculi ring-like, not surrounded by setae. Cephalic setae 0.065–0.075 mm long, 2.0–4.0 times as long as the basal width of antennal segment III ..... *C. perglandulosa*
   Siphunculi ring-like on slightly elevated cone, surrounded by 4 or 5 setae. Cephalic setae 0.030–0.050 mm long, 1.2–2.0 times as long as the basal width of antennal segment III ..... *C. beijingensis*
10. Pronotum without spinal wax gland plates. Wax gland plates on abdominal tergite VIII with more than 20 facets ..... *C. doipuiensis*
    Pronotum with 1 pair of spinal wax gland plates. Wax gland plates on abdominal tergite VIII with less than 18 facets 11
11. Cauda with more than 10 setae ..... *C. uscare*
    Cauda with less than 10 setae 12
12. Frontal horns 0.020–0.025 mm long, 1.26–2.50 times as long as its basal width ..... *C. keduensis*
    Frontal horns less than 0.016 mm long, less than times as long as its basal width 13
13. Head dorsum with 1 pair of wax gland plates between eyes, each composed of 10–13 facets ..... *C. xiyui* Wang, **sp. n.**
    Head dorsum with 1 pair of wax gland plates between eyes, each composed of 6–8 facets ..... *C. hainanensis* Wang, **sp. n.**
14. Abdominal tergites without demarcated wax gland plates, almost entirely covered with indistinct minute "dots" that may produce wax ..... *C. cerbera*
    Abdominal tergites I–VII each with developed marginal wax plates, tergite VIII with spino-pleural wax gland plates 15
15. Marginal wax gland plates on abdominal tergites I–VI each with 0–5 wax gland facets ..... *C. floccifera*
    Marginal wax gland plates on abdominal tergites I–VI each with more than 5 wax gland facets 16
16. Head without wax gland plates between eyes 17
    Head with wax gland plates between eyes 20
17. Wax gland plate on abdominal tergite VIII with more than 25 facets ..... *C. longifila*
    Wax gland plate on abdominal tergite VIII with less than 25 facets 18
18. Abdominal tergite VIII with less than 5 setae ..... *C. japonica*
    Abdominal tergite VIII with more than 5 setae 19
19. Fore tibia distinctly shorter than head width across eyes ..... *C. nekoashi* (probably wrong according to Takahashi 1958, should be placed in 25)
    Fore tibia 0.92–1.04 times as long as head width across eyes ..... *C. orientalis*
20. Wax gland plate on abdominal tergite VIII with more than 30 facets ..... *C. multiglandula*
    Wax gland plate on abdominal tergite VIII with less than 30 facets 21

21. Body blackish in life 22
    Body yellowish in life 25
22. Body blackish purple or deep brownish in life. Wax gland plates between eyes each with 5 or 6 facets 23

Body black, grayish, or dark green in life. Wax gland plates between eyes each with 1–4 facets 24

23. Body deep brownish in life. Wax gland plates on abdominal tergite VIII with 11 or 12 wax gland facets..... .....*C. spinulosa*

Body blackish purple in life. Wax gland plates on abdominal tergite VIII with about 20 facets .... *C. oplismeni*

24. Antennae 5-segmented. Horn long, 1.30 times as long as antennal segment II. Marginal wax gland plates on slightly brown sclerites, each wax gland facets touch each other; wax plate on abdominal tergite VIII with more than 20 facets .....*C. graminum*

Antennae 4-segmented. Horn short, 0.30–0.49 times as long as antennal segment II. Marginal wax gland plates not on pigmented sclerites, wax gland facets not touch each other; wax plate on abdominal tergite VIII with less than 10 facets.....*C. atrovirensa*

25. Body yellow or brownish in life.....*C. panici*

Body yellowish orange in life 26

26. Abdominal tergite VII with 1 pair of spinal, pleural and marginal setae 27

Abdominal tergite VII with only 1 pair of setae between marginal wax plates..... *C. subtropicana*

27. Wax gland plate on abdominal tergite VIII with more than 20 facets ..... *C. lanigera*

Wax gland plate on abdominal tergite VIII with 10-12 facets.....*C. pikachuae* **Wang, sp. n.**

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References

Agarwala BK & Ghosh AK 1985: Monograph on Oriental Aphidoidea: Key to the genera and synoptic list. *Memoirs of the Zoological Survey of India*, 16 (3): 1–118.

Aoki S & Kurosu U 2010: A review of the biology of Cerataphidini (Hemiptera, Aphididae, Hormaphidinae), focusing mainly on their life cycles, gall formation, and soldiers. *Psyche: A Journal of Entomology*, 1 [380351]: 1–34. https://doi.org/10.1155/2010/380351

Aoki S, Kurosu U, Kutsukake M, Hsieh TJ, Yang M, Choe JC & Fukatsu T 2013: The aphid *Ceratovacuna nekoashi* (Hemiptera: Aphididae: Hormaphidinae) and its allied species in Korea, Japan and Taiwan. *Entomological Science*, 16 (2): 203–221. https://doi.org/10.1111/ens.12002

Favret C & Aphid Taxon Community (Eds) 2025: *Blackman & Eastop's Aphids on the World's Plants. version 1.0.* Available from: https://aphidsonworldsplants.info/ (Accessed: 9.I.2026).

Favret C 2024: *Aphid Species File*. Available from: http://Aphid.SpeciesFile.org (Accessed: 9.I.2026)

Fukatsu T, Aoki S, Kurosu U & Ishikawa H 1994: Phylogeny of Cerataphidini aphids revealed by their symbiotic microorganisms and basic structure of their galls: Implications for host-symbiont coevolution and evolution of sterile soldier castes. *Zoological Science*, 11 (4): 613–623. https://doi.org/10.34425/zs001250

Ghosh MR, Pal PK & Raychaudhuri DN 1977: Studies on the aphids (Homoptera: Aphididae) from eastern India 21. The genus *Astegopteryx* Karsch and other related genera (Hormaphidinae), with descriptions of three new genera and two new species. *Proceedings of the Zoological Society*, Calcutta, 27: 81–116.

Hempel A 1901: A preliminary report on some new Brazilian Hemiptera. *Annals and Magazine of Natural History*, 8 (47): 383–391.

Jiang L-Y, Chen J, Guo K & Qiao G-X 2015: Review of the genus *Ceratovacuna* (Hemiptera: Aphididae) with descriptions of five new

species from China. *Zootaxa*, 3986 (1): 35–60.
https://doi.org/10.11646/zootaxa.3986.1.2

Jiang L-Y, Chen J, Xu Y & Qiao G-X 2021: *Ceratovacuna atrovirensa* Qiao, a new species from China (Aphididae: Hormaphdinae). *Journal of Asia-Pacific Entomology*, 24 (3): 564–572.
https://doi.org/10.1016/j.aspen.2021.04.016

Kirkaldy GW 1905: Catalogue of the genera of the hemipterous family Aphidae, with their typical species, together with a list of the species described as new from 1865 to 1905. *The Canadian Entomologist*, 37 (12): 414–420.

Kurosu U & Aoki S 1990a: Formation of a "cat's-paw" gall by the aphid *Ceratovacuna nekoashi* (Homoptera). *Japanese Journal of Entomology*, 58 (1): 155–166.

Kurosu U & Aoki S 1990b: Non-feeding sexuales of *Ceratovacuna nekoashi* (Homoptera, Aphidoidea). *Kontyû, Tokyo Entomological Society*, 58 (4): 831–834.

Noordam D 1991: Hormaphidinae from Java (Homoptera: Aphididae). *Zoologische Verhandlingen*, 270: 1–525.

Qiao G-X & Zhang G-X 2003: *Ctenopteryx* (Hemiptera: Hormaphidinae), a new genus from China, and a description of a new species. *The Pan-Pacific Entomologist*, 79 (2): 145–150.

Qiao G-X, Jiang L-Y, Chen J, Zhang G-X & Zhong T-S 2018: *Fauna Sinica. Insecta Vol. 60. Hemiptera: Hormaphididae, Phloeomyzidae*. Science Press, Beijing, 398 pp. [乔格侠, 姜立云, 陈静, 张广学 & 钟铁森 2018: 中国动物志：昆虫纲 半翅目 扁蚜科 平翅绵蚜科（第 60 卷）. 科学出版社, 北京, 398 pp.]

Sasaki C 1907: Ego-no-nekoashi, part I. *Transactions of the Entomological Society of Japan*, 1 (3): 25–30.

Shinji O 1941: *Monograph of Japanese Aphididae*. Shinkyo Sha Shoin, Tokyo, 1215 pp.

Stern DL, Aoki S & Kurosu U 1997: Determining aphid taxonomic affinities and life cycles with molecular data: a case study of the tribe Cerataphidini (Hormaphididae: Aphidoidea: Hemiptera). *Systematic Entomology*, 22 (1): 81–96.
https://doi.org/10.1046/j.1365-3113.1997.d01-20.x

Takahashi R 1931: *Aphididae of Formosa Part 6*. Report of the Department of Agriculture Government Research Institute Formosa, Taipei, 127 pp.

Takahashi R 1958: On the aphids of *Ceratovacuna* in Japan (Aphididae, Homoptera). *Kontyû, Tokyo Entomological Society*, 26:187–190.

Tao CC (1969) Aphid fauna of China. *Science Yearbook of the Taiwan Museum*, 12: 40–99.

Tao CC (1991) *Aphid Fauna of Taiwan Province, China.* Taiwan Provincial Museum, Taipei, 327 pp.

Wang Y-Z & Huang X-L 2024: Taxonomic notes on the genus *Chaitoregma* (Hemiptera, Aphididae, Hormaphidinae), with description of a new species from China. *ZooKeys*, 1218: 35–47.
https://doi.org/10.3897/zookeys.1218.133287

Zehntner L 1897: Overzicht van de ziekten van het suikerriet op Java. Vijanden uit het dierenrijk. *Archief voor de Java-Suikerindustrie*, 5 (1): 525–575.

Zhang R-L, Huang X-L, Jiang L-Y & Qiao G-X 2013: Molecular phylogenetic evidence for paraphyly of *Ceratovacuna* and *Pseudoregma* (Hemiptera, Hormaphidinae) reveals late Tertiary radiation. *Bulletin of Entomological Research*, 103: 644–655.
https://doi.org/10.1017/s0007485313000321

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Photo Gallery

Pareuthymia fusca Willemse, 1930
Kinabalu Park, Borneo Island
photograph by Tian-Jiao WANG [王天骄]